14758ROUS01U　　　　　　　　　　20

We Claim:

1.　A method of routing a special type of a data transmission unit (DTU) between a source node and a destination node in a network that only allows unidirectional routing, both the source node and the destination node being capable of processing the special type of data transmission unit, the method comprising:

a) selecting intermediate nodes to be traversed by the DTU when transmitted from the source node to the destination node;

b) designating the intermediate nodes selected in step a) as being in a specific path of nodes between the source node and the destination node;

c) creating the DTU at the source node; and

d) transmitting the DTU from the source node to the destination node along the specific path of nodes.

2.　A method as in claim 1 wherein the special type of a data transmission unit is an OAM (operation and maintenance) data transmission unit.

3.　A method as in claim 1 wherein the special type of a data transmission unit is a data transmission unit for use in determining a performance of a network segment.

4.　A method as in claim 1 wherein the network is an MPLS (Multi-Protocol Label Switched) network.

14758ROUS01U   21

5.   A method as in claim 1 wherein step b)
includes notifying the intermediate nodes of the
specific path.

6.   A method as in claim 5 wherein step b)
further includes reserving resources in the
intermediate nodes for the specific path.

7.   A method as in claim 1 wherein the
source node and the destination nodes are routers.

8.   A method as in claim 7 wherein the
routers are label switched routers (LSRs).

9.   A method of segmenting a predefined
path through a network that only allows
unidirectional transmission, the method comprising:
          a) determining which nodes on the network
are on the predefined path;
          b) defining segment nodes that define
beginning and ending nodes for a network segment; and
          c) configuring a network segment between
beginning and ending nodes by instructing intervening
nodes on how to forward data transmission units
configured for that network segment.

10.   A method as in claim 9 wherein the
beginning and ending nodes are routers.

11.   A method as in claim 10 wherein the
routers are label switched routers (LSRs).

12.   A method as in claim 9 wherein step c)
is accomplished by using label distribution protocols
(LDPs).

14758ROUS01U   22

13. A method as in claim 9 wherein the network is an MPLS (Multi-Protocol Label Switched) network.

14. A method as in claim 9 wherein the data transmission units are specialized for use in performance and status checks.

15. A method of determining a performance of a network path, the method comprising:
a) dividing the network path into segments, each segment having a source node defining a beginning of the segment and a destination node defining an ending of the segment;
b) transmitting a specialized data transmission unit from the source node to the destination node;
c) receiving the specialized data transmission unit at the destination node; and
d) calculating the performance of the segment based on data contained in the specialized data transmission unit.

16. A method as in claim 15 wherein the network path is in an MPLS network.

17. A method as in claim 15 wherein step d) includes determining a transit time of the specialized data transmission unit through the segment.

18. A method of determining a performance of a network path, the method comprising:
a) dividing the network path into segments, each segment having a source node defining a

beginning of the segment and a destination node
defining an ending of the segment;

     b) transmitting a specialized data
transmission unit from the source node to the
destination node; and

     c) determining if there is a fault on the
segment based on whether the specialized data
transmission unit is received by the destination node
within a given amount of time.

     19. A method as in claim 18 wherein the
network path is in an MPLS network.

     20. A network router for routing data
transmission units (DTUs) in a domain which only
allows unidirectional flow, the router including:

     - a receiving module for receiving DTUs;

     - a transmitting module for transmitting
DTUs;

     - a switch core module placed between the
receiving module and the transmitting module for
routing DTUs between the receiving and the
transmitting modules; and

     - a diagnostic module for determining a
performance of a network path of the domain, the
diagnostic module being for processing specialized
DTUs received by the receiving module and for
creating specialized DTUs to be transmitted by the
transmitting module,
wherein the router executes computer readable and
computer executable instructions for implementing a
method for determining the performance of the network
path, the method including:

     a) if the network router is a source node
for the network path, transmitting the specialized
DTUs to a destination node; and

14758ROUS01U   24

    b) if the network router is a destination node for the network path, receiving the specialized DTUs and performing an action chosen from the group consisting of:

        b1) calculating the performance of the network path based on data contained in the specialized DTU; and
        b2) determining if there is a fault on the network path based on whether a specialized DTU is received within a given amount of time.

    21. A network router as in claim 20 wherein the network path is in an MPLS network.

    22. A network router as in claim 20 wherein the specialized DTU is an OAM DTU.

    23. A network router as in claim 21 wherein the specialized DTU is an OAM DTU.